

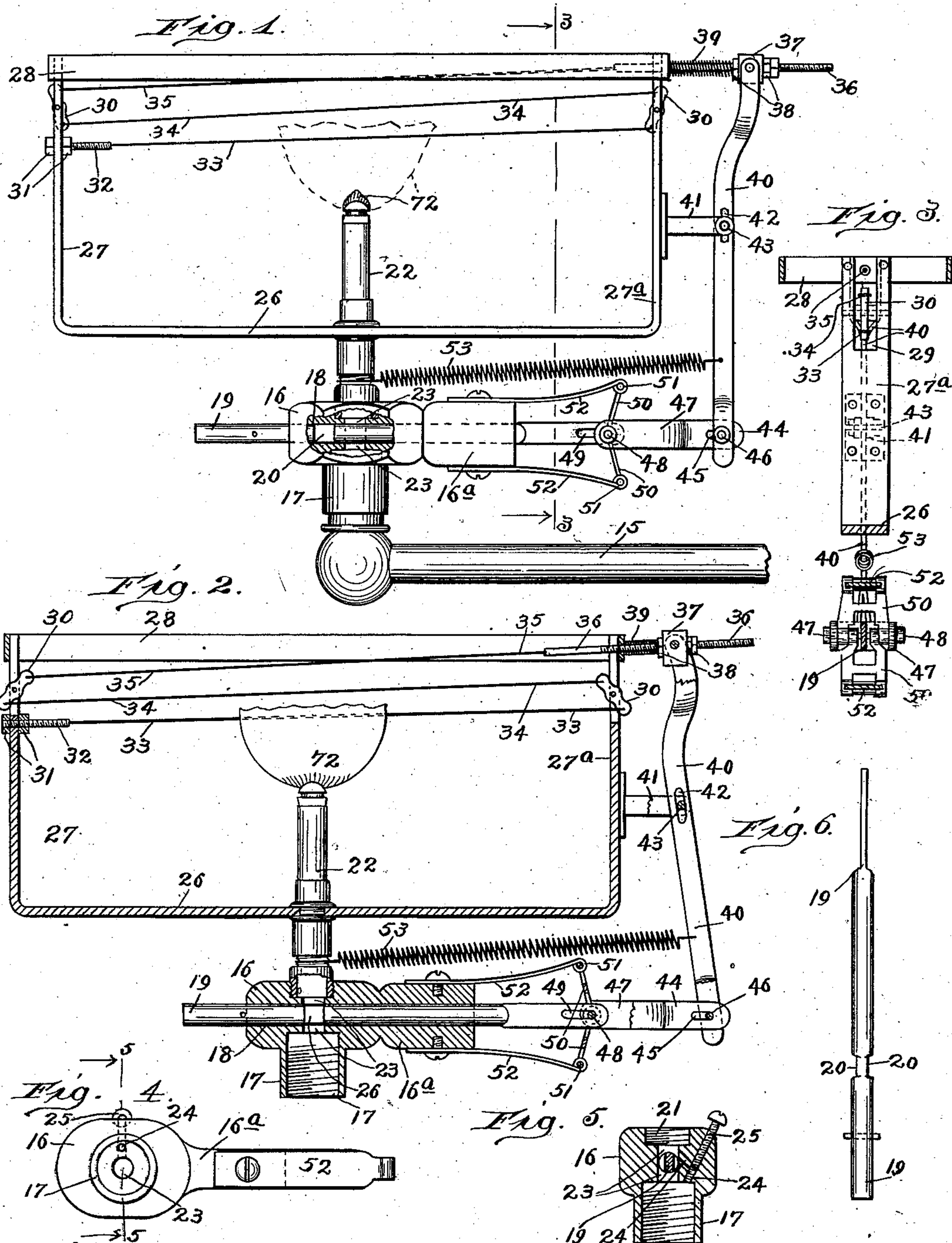
No. 859,899

PATENTED JULY 9, 1907.

S. BERENS.
THERMOMECHANICAL FLASH LIGHT APPARATUS.

APPLICATION FILED MAY 24, 1906.

2 SHEETS—SHEET 1.



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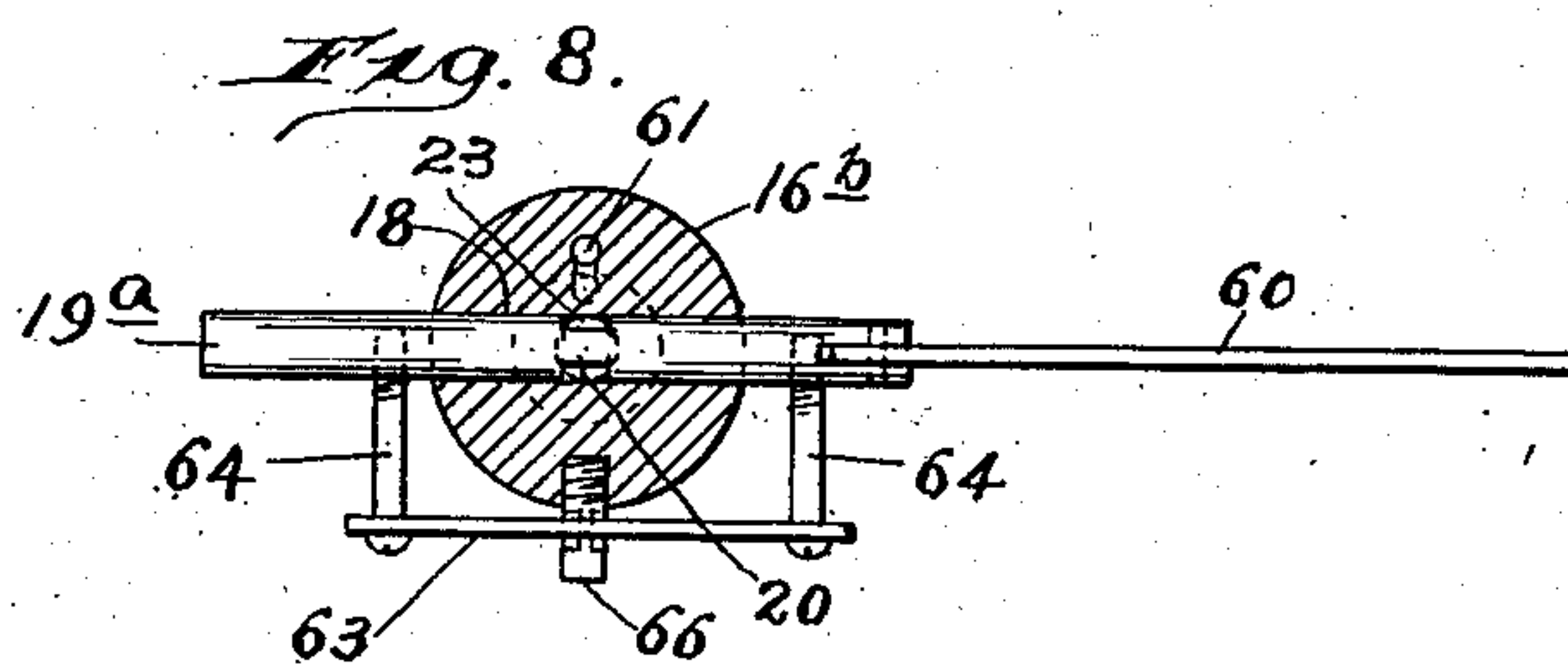
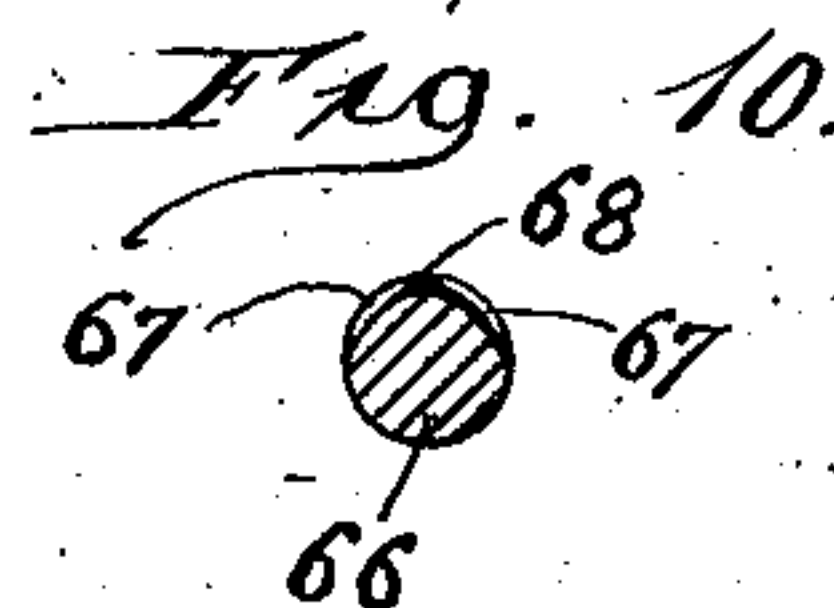
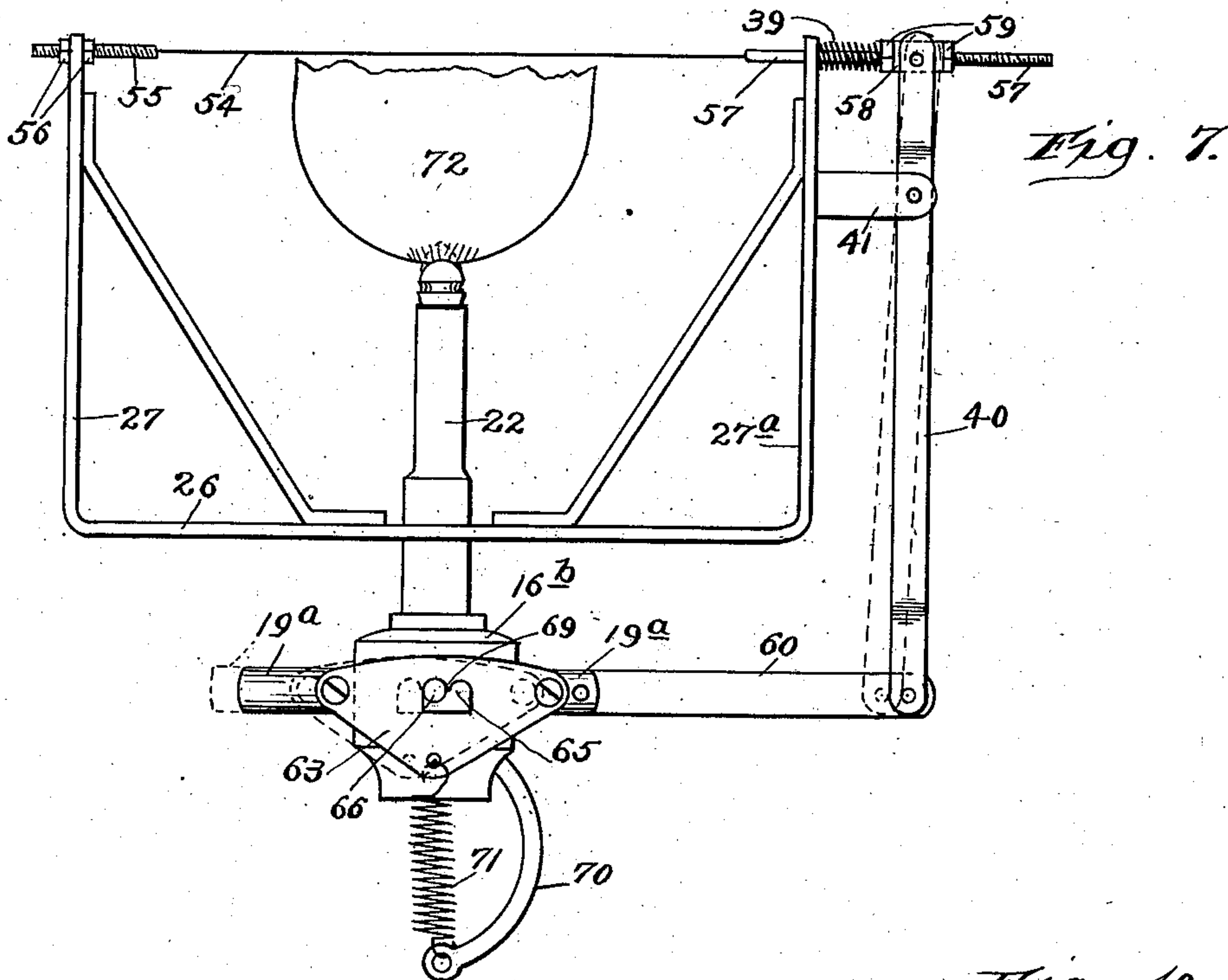
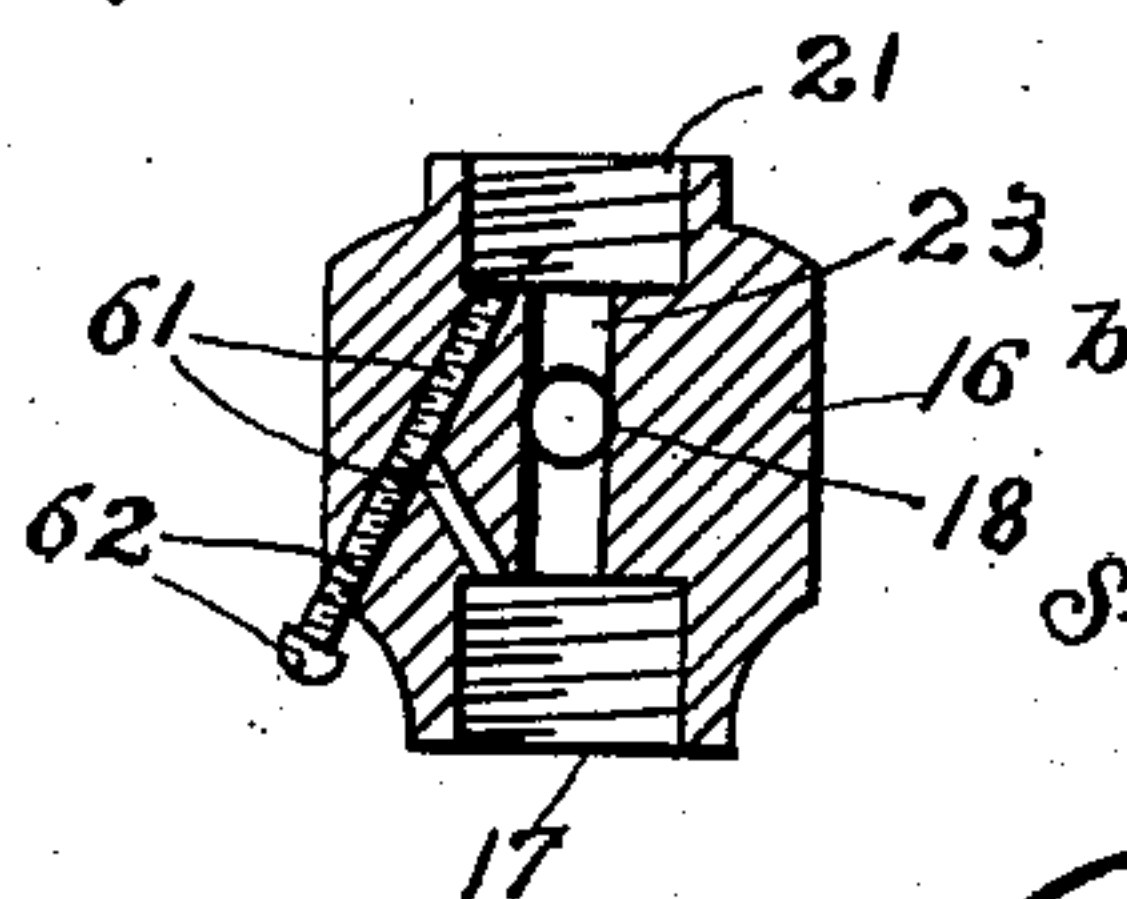


Fig. 9



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UNITED STATES PATENT OFFICE.

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THERMOMECHANICAL FLASH-LIGHT APPARATUS.

No. 859,899.

Specification of Letters Patent.

Patented July 9, 1907.

Application filed May 24, 1906. Serial No. 318,438.

To all whom it may concern:

Be it known that I, STANISLAUS BERENS, a citizen of the United States, residing at La Grange, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in a Thermo-mechanical Flash-Light Apparatus, of which the following is a specification.

The subject of the present invention is a novel automatic apparatus for gas burners, of the thermo-mechanical type, to be used for intermittently producing flash lights or flames of great or less brilliancy to be employed in connection with signs or for other purposes, and has particularly in view to provide simple and efficient means, of the character stated, capable of being applied to existing constructions of gas fixtures with comparatively little alteration therein, labor or expense, and which shall be so constructed that in its operation the size or brilliancy of the flame will be instantly increased or diminished, thus insuring distinctly defined flashes.

The invention consists in certain novel features, of the construction, combinations and arrangements of the several parts of the apparatus, whereby certain improved advantages are attained and the device is rendered simple, convenient and effective for use, all as will be hereinafter fully set forth.

The novel features of the invention will be carefully defined in the claims.

In the accompanying drawings which serve to illustrate my improvements—Figure 1 is a view in side elevation of a flash light apparatus embodying one form of the invention, showing it applied to a gas fixture and illustrating the parts by continuous lines in their normal positions or in the positions they will occupy when the flame and supply of gas is reduced to a minimum. Fig. 2 is a central vertical sectional view through the valve casing and the yoke which supports the expansible wires, but showing the other parts in elevation and illustrating them in the positions they will occupy when a full supply of gas is turned on to create a brilliant flame. Fig. 3 is a cross-sectional view of a portion of the apparatus, taken on line 3, 3 of Fig. 1 looking in the direction indicated by the arrows. Fig. 4 is a bottom plan view of the valve casing. Fig. 5 is a cross-sectional view thereof, taken on line 5, 5 of Fig. 4 looking in the direction indicated by the arrows. Fig. 6 is a detached view in elevation of the valve stem. Fig. 7 is a view in elevation of the apparatus, showing a modification in its construction and illustrating it as detached from the gas fixture or supply pipe. Fig. 8 is a horizontal sectional view, taken through the valve casing shown in Fig. 7 just above the valve stem therein. Fig. 9 is a central vertical sectional view of the valve casing shown in Figs.

7 and 8;—and—Fig. 10 is a cross-sectional view of the pin used on said valve casing for regulating the movement of the valve therein.

Like numerals of reference, refer to corresponding parts throughout the different views of the drawings.

The reference numeral 15 designates a gas pipe or fixture, which may be of the ordinary construction and suitably supported. Mounted on the discharging end of the pipe or fixture 15 is a valve casing 16, which is provided on its lower part with an internally screw-threaded extension 17 to engage a portion of the supply pipe, and has extending longitudinally and horizontally therethrough an opening 18 for the reciprocating or sliding valve stem 19, which is formed at a suitable point between its ends with transverse and vertical recesses 20, as is clearly shown in Figs. 5 and 6 of the drawings. The valve casing 16 is provided on its upper surface or directly opposite the extension 17 with a screw-threaded socket 21, into which the gas burner 22 may be screwed or connected thereto in any desired manner, and which burner may be of the ordinary or any preferred construction.

Extending from the socket 21 through the valve casing 16, and communicating with the hollow or extension 17, is a channel 23 for the passage of the main supply of gas to the burner, which channel is intersected by the valve stem 19, as is clearly shown. The casing 16 is also provided with a channel or by-pass 24, which communicates at its lower end with the upper portion of the extension 17 and at its upper end with the channel 23 above the valve chamber or opening 18 therein, as will be readily understood by reference to Fig. 5 of the drawings, in which view it will be seen that the casing 16 is provided with a regulating screw 25, which is adapted to enter the lower portion of the channel 24, and is to be used for controlling the flow of gas through said channel or by-pass, which may be done by turning the screw 25 in the proper direction.

Mounted above the fixture, and by preference on the burner 22, is a yoke or frame 26, the upturned ends or portion 27 and 27^a of which are preferably connected together by means of a rectangular and horizontally disposed frame 28 located at the top of said portions. Each of the upturned portions 27 and 27^a of the yoke or frame 26 has pivotally secured on its upper portion and usually in a slot 29 therein a lever 30, which have free pivotal movements on said upturned parts. Adjustably secured on the upward extension 27 just below the lever 30 thereon, by means of jam-nuts 31, is a screw-threaded rod 32, to which is secured at one of its ends an expansible wire 33, the other end of which is secured to the lower portion of the lever 30 on the upward extension 27^a of the yoke.

Secured at one of its ends to the upper portion of the lever 30, on the extension 27^a, is another expansible wire 34, the other end of which is secured to the lower portion of the lever 30 on the extension 27, which lever has secured to its upper portion one end of an expansible wire 35, the other end of which is secured to the inner end of a rod 36 which is loosely and horizontally located in the upper portion of the extension 27^a, as well as in the end of the frame 28 adjacent to said extension. A part of the rod 36 is screw-threaded and has mounted thereon a block 37, which may be adjusted on the rod 36 by means of nuts 38 located on and engaging said rod. Surrounding the rod 36 and resting at one of its ends on the frame 28 is a spring 39, the other end of which rests against one of the nuts 38, as is clearly shown in Figs. 1 and 2 of the drawings. Pivotaly secured at its upper end to the block 37 is a lever 40, which is fulcrumed on a horizontally extending bracket 41 secured to the upward extension 27^a of the yoke or frame.

As shown in Figs. 1 and 2, the rod 36 is located in a slightly inclined position, and as the lever 40 is pivotally and adjustably connected to said rod and must move therewith in the expansion and contraction of the wires 33 to 35, inclusive, it is apparent that the lever 40 will have a slight longitudinal movement, and for this reason it is provided with a slot 42 for the fulcrum 43, which passes through said slot. The upper and lower ends of the lever 40 are preferably forked so as to stride or embrace the block 37 and a link 44, respectively. The link 44 is provided near one of its ends with a slot 45, through which is passed a pin 46 used for pivotally and movably connecting said link to the lower end of the lever 40 and, by preference, between the prongs of said lever. The inner portion of the link 44 or that part thereof adjacent to the valve casing 16 is provided with prongs 47, in or near the ends of which is located a pintle or small shaft 48 which passes through a longitudinal slot 49 in the valve stem 19 near one of its ends.

Hinged at one of their ends on the pintle or shaft 48 are two oppositely extending plates or members 50, each of which carries on its outer end a transverse rod or shaft 51 to each of which is loosely connected one end of a spring 52, the other ends of which are rigidly secured on opposite sides of an extension 16^a of the valve casing. Connected at one of its ends to the lower portion of the lever 40 is a coiled spring 53, the other end of which is secured to the burner 22, or other suitable support.

In Figs. 7 to 10, inclusive, I have shown a modification in the construction of the parts of the apparatus which I may sometimes employ, and which consists in employing a single expansible wire 54 instead of a plurality of such wires as in the other construction, which is horizontally located on the upper portion of the extensions 27 and 27^a of the yoke or frame. This expansible wire is secured at one of its ends to a screw-threaded rod 55, which is adjustably secured by means of nuts 56 on the upper portion of the upright 27 and at its other end to a rod 57, which is partly screw-threaded and is loosely and horizontally mounted on the upper portion of the upright 27^a of the yoke. A block 58 is mounted on the rod 57 and may be adjusted thereon by means of nuts 59 located

on said rod. Surrounding the rod 57 and resting at one of its ends against the extension 27^a is a spring 39, the other end of which rests against one of the nuts 59, as is clearly shown in Fig. 7 of the drawings. In this modified construction, the lever 40 is fulcrumed on a horizontally extending bracket 41 on the extension 27^a, as in the other construction, but as the rod 57 will have a horizontal movement instead of a horizontally inclined movement as in the other case, no provision for the longitudinal movement of the lever 40 need be made. The lower end of the lever 40 of the modification now under consideration is pivotally secured to one end of a link 60, the other end of which is similarly secured to one end of the valve stem 19^a, which passes through a transverse opening 18 in the modified valve casing 16^b which is cylindrical in shape and has a hollow extension 17 on its lower portion for engagement with the supply pipe or fixture, and a screw-threaded socket 21 on its opposite surface for engagement with the burner 22. The valve casing 16^b is also provided with a channel 23 for the main supply of gas, which channel communicates with the hollow of the extension 17 and with the socket 21, yet is intersected by the channel 18 through which the valve stem 19^a passes. The valve casing 16^b is also provided with a channel or by-pass 61, which communicates at one of its ends with the hollow of the extension 17 and at its other end with the socket 21, and may be closed or partially closed so as to regulate the flow of gas through said by-pass by means of a screw 62, which is adapted to enter a portion of the channel 61, as will be readily understood by reference to Fig. 9 of the drawings, in which figure it will be noted that the screw 62 is located in the lower portion of the casing 16^b, while in the construction shown in Figs. 1 to 5, inclusive, the screw 25 used for regulating the flow of gas through the by-pass, is located in the upper portion of the casing.

As shown in Figs. 7 and 8, the valve stem 19^a is provided with a plate 63, which is supported on the stem 19^a by means of screws 64 or rods engaging said stem one on each side of the casing. The plate 63 is formed with a cam-race or opening 65 for the reception and operation of a pin 66, horizontally secured to the valve casing. This pin is beveled as at 67 (see Fig. 10) on the upper portion of each of its sides to form an edge 68 to co-act with a projection 69 at the middle of the upper edge of the opening 65 in the plate 63, so as to give said plate a sudden movement after it has been raised until the projection 69 rests on the edge or apex 68 of the pin 66. Extending downwardly from the casing 16^b is an arm 70, to the lower end of which is secured one end of a spiral spring 71, the other end of which is connected to the plate 63, and said spring is employed to assist in actuating the valve stem 19^a with a quick or sudden movement so as to turn on or cut off the supply of gas through the main channel 23 instantly, thereby creating distinct flashes.

From the foregoing and by reference to the drawings it will be understood and clearly seen that, by using a plurality of expansible wires located one above the other in the path of the heat from the flame 72, and connected together as shown and above described, they will afford a greater degree of expansion and con-

traction than if a single wire is employed, as shown in Fig. 7 of the drawings. It is also apparent that in the construction shown in Fig. 1, the tension of the wires 33 to 35, inclusive, may be regulated by means of the rods 32 and 36 and the nuts thereon, and also that the movement of the lever 40 may be regulated by suitably adjusting the block 37 to which it is pivotally secured at its upper end on the rod 36, and the same may be said in regard to the single wire and lever shown in the modified construction.

In operation, when the parts are in the positions shown in Fig. 1, it is apparent that a small quantity of gas will pass from the supply pipe or fixture 15 through the by-pass 24 of the valve casing and out through the burner, where it may be ignited to produce a small blaze, as shown by continuous lines in Fig. 1, when by shifting the parts to the position shown in Fig. 2, a full supply of gas will be discharged through the main channel 23 and out through the burner, thus increasing the flame 72 so as to heat and expand the wires 33 to 35, inclusive, which operation will cause the parts to assume the positions shown in Fig. 1, thus reducing the flame and thereby permitting the said wires to cool and contract, which operation will again cause the parts to assume the positions shown in Fig. 2. These operations will be repeated alternately, and it is evident that in the reciprocal movement of the valve stem 19 the plates or members 50 will be gradually brought into vertical alinement, at which time the springs 52 will exert their greatest strength or energy thereon so that further movement of the valve stem will throw them suddenly out of vertical alinement, and, through the instrumentality of the shaft or pintle 48 which is located in the slot 49, will cause the valve stem 19 to be moved suddenly so as to cut off or turn on the gas through the main supply channel of the valve casing.

In the construction set forth in Fig. 7, the operation is practically the same as above described, ex-

cept that the spring actuated plate 63 having the cam-race or opening 65 in conjunction with the pin 66 will produce the sudden movement of the valve stem 19^a so as to instantly open and close the main supply channel 23 in the vertical casing, as has been previously set forth.

Having thus fully described my invention, what I claim as new and desire to secure by Letters-Patent, is—

1. In an automatic flash light apparatus, the combination with a gas fixture, of a gas regulating valve mounted thereon, a yoke or frame mounted on the burner of the fixture, expansible means mounted on the upper portion of the yoke or frame and consisting of a plurality of wires located one above the other but pivotally connected together, a lever fulcrumed on the yoke and adjustably connected at one of its ends to said expansible means, and means connecting the other end of said lever to the valve, substantially as described.

2. In an automatic flash light apparatus, the combination with a gas fixture, of a gas regulating valve mounted thereon, a yoke or frame mounted on the burner of the fixture, expansible means mounted on the upper portion of the yoke or frame and consisting of a plurality of wires located one above the other but pivotally connected together, a lever fulcrumed on the yoke and adjustably connected at one of its ends to said expansible means, and means connecting the other end of said lever to the valve to impart to the latter at a given point in its travel sudden reciprocal movement.

3. In an automatic flash light apparatus, the combination with a gas fixture, of a gas regulating valve mounted thereon, a lever fulcrumed near the burner of the fixture, expansible means connected to one end of said lever and located so as to be exposed to the heat of the flame of the fixture, a forked link loosely secured at one of its ends to the other end of said lever and loosely secured at its other end to the valve, a pair of oppositely extending plates pivotally secured between the prongs and said link, a pair of springs connected at one of their ends to the valve and loosely connected at their other ends to said plates, substantially as described.

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